

Pallid Sturgeon/Fish & Wildlife Technical Working Group
7 July 2005 Draft Quasi-Natural Alternative (formerly “Jacobson option”)
Action Plan

Scientific information on specifically how flow affects pallid sturgeon reproductive success in the Missouri River is currently inadequate to enable the Pallid Sturgeon/Fish & Wildlife Technical Working Group (PS/WLG) to articulate specific flows for the 2006 spring rise (SR). Thus, the PS/FWG recommends using the “natural” hydrograph to design what it considers to be an ecologically relevant spring rise (SR) for pallid sturgeon reproduction and recruitment. If implemented, this flow “experiment” will increase our knowledge of how a spring rise and other environmental factors influence pallid sturgeon spawning and recruitment. It will enable future SR modifications to be designed in an adaptive fashion to support the species’ recovery.

Assumptions: The Quasi-Natural Alternative (QNA) will have 2 flow peaks (not plateaus) corresponding to those that occurred historically at reference sites. The priority of hydrologic indicators used to design the alternative will be: timing of peak flow, magnitude peak flow, duration of flow event, rate of flow fall, and rate of flow rise, listed in order of decreasing importance. Separate alternatives will be developed for “dry”, “normal” and “wet” discharge calendar years. Gavins Point Dam releases for 2006 are assumed to be minimum navigation service. Water temperature will be related to discharge to aid in refining the QN alternatives relative to pallid spawning temperatures. Reference sites where the QN alternative will be initially designed are Gavins Point Dam, SD (GPD) and Sioux City, IA (gages) which bracket the segment of primary concern for effects of the SR and for which adequate water temperature data are available

Approach: Robb Jacobson (USGS) will prepare alternatives for COE to model following approval of the PS/FWG. The 100 year record of ROR flows at Gavins Point Dam (GPD) and Sioux City will be broken into thirds representing the continuum from dry to normal to wet years as follows:

Table 1. Criteria for identifying “dry”, “normal”, and “wet” flow years to include in a quasi-natural spring rise flow alternatives.

	%TILE RANGE	%TILE MIDPOINT
DRY	0-33	16.5
NORMAL	34-66	50
WET	67-100	83.5

Once years are selected for each category Robb will analyze years within each category to identify the 25th, 50th, and 75th %tiles for timing, peak, duration of event, rate of fall, and rate of rise for the first and second peaks. Each of these indicators will be estimated as follows:

Table 2. Prototype matrix for establishing hydrologic indicators to be used to design a first and second Missouri River spring rises at Gavins Point Dam and Sioux City, IA.

Indicator	25th		50th		75th	
	1st	2nd	1st	2nd	1st	2nd
Timing	set	set	set	set	set	set
Magnitude	design	design	design	design	design	design
Duration	design	design	design	design	design	design
Rate of Fall	float	float	float	float	float	float
Rate of Rise	float	float	float	float	float	float

Where “set” refers to dates would be set to medians of whole record for dry, normal and wet periods (reflecting priority). “Design” means that percentiles would be used to design alternatives. “Float” means that rate of rise and rate of fall would be calculated to meet magnitude and duration, adjusted so rate of fall is coefficient*rate of rise, coefficient based on medians of record. This will yield a fall rate more gradual than the rise rate.

Discussions with Aaron Delonay indicated that his “Biologists view of the world alternative” may be met by linking water temperature with the QN alternative, at least as a first cut for him to review.

QN alternative matrices will be constructed from these results by the PS/FWG and be provided to the COE to run in their model. Draft output will be evaluated against the sideboards defined by the Revised Master Manual and 2003 Amended BiOp and revised as needed to meet these requirements. 1-3 revised draft QN alternatives for GPD flow releases will be submitted to the Plenary for their consideration.

Timeline: NEED TO FILL IN ASAP

Draft QN matrices to PS/FWG:

Round 1 QN alternatives to Hydrology Group and COE:

COE Response to PS/FWG and Hydrology Group:

Revisions by PS/FWG:

QN alternatives submitted by PS/FWG to Plenary: